98-WA-31

USA DRY PEA & LENTIL COUNCIL

April 7, 1998

To: Jim Saulmon

From: Robert Gareau

Subject: Answers to questions on pyridate Section 18

1. Growing conditions in Oregon and Washington for chickpeas have not changed much since last year's request. The winter was quite mild, and some growers in the Walla Walla region planted some chickpea field in late March.

2. Growing conditions in Idaho are slightly different. The growing season is shorter, and planting usually takes place later than Oregon and Washington, however, light snow this past winter has allowed some growers to plant chickpeas unusually early.

3. The expected yield loss in Washington and Oregon without the use of pyridate is 50-60 %

4. The expected yield loss in Idaho without the use of pyridate is 50-60 %

5. Yes, Oregon's data should suffice for Washington and Idaho.

6. In Idaho, Oregon and Washington, all 4 broadleaf weeds (a-d) are targeted. In Idaho, there is less of a problem with kochia than in Washington and Oregon, although it can still be a problem weed.

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4

4/22/99 Copy files.

MEMORANDUM

Subject: Review of Request by Montana, Oregon, Washington, Idaho, Indiana, and Wisconsin for the Use of Pyridate (AI: 128834) on Mint to Control Kochia and Redroot Pigweed

ID#	BARCODES
(99-MT-12)	D254473, D254474
(99-OR-27)	D254483, D254482
(99-WA-37)	D254980, D254979
(99-ID-26)	D254984, D254892
(99-IN-03)	D254796, D254807
(99-WI-10)	D254787, D254790

From: James G. Saulmon
Herbicide and Insecticide Branch
Biological and Economic Analysis Division (7503C)

Stephen Smearman
Economic Analysis Branch
Biological and Economic Analysis Division (7503C)

To: Barbara Madden/Robert Forrest
Registration Support Branch
Registration Division (7505C)

Summary

We have reviewed the requests by Montana, Oregon, Idaho, Washington, Indiana, and Wisconsin for an emergency exemption to use pyridate on mint to control kochia and redroot pigweed. We find the situations in these 6 states to be non-routine due to lack of effective weed control.

(1)

Biological Aspects

Our conclusions in regard to the issue of Oregon's previous sec 18 this year (99-OR-06) plus the current sec 18 (99-OR-27) resulting in 2 sec 18s for use on mint in one year follow: We have no problem with the second Oregon request during 1999 (99OR27) because Oregon mint growers will likely receive limited benefit from pendimethalin due to the following factors: (1) Pendimethalin has a 115-day preharvest interval and in some regions of Oregon snow cover and frozen soils prevent use of pendimethalin because the 115-day phi has been entered. (2) About one third of the total mint acreage is grown in the Willamette Valley where the mint never enters full dormancy due to milder winter climate. Thus, pendimethalin can not be used in this area due to possible injury (phytotoxicity) to the mint. In January, 1999 the agency granted Oregon sect. 18 request (99OR06) for pendimethalin applied preemergence to control kochia and redroot pigweed in mint when the mint is dormant. Pendimethalin is highly phytotoxic to the mint plant and therefore it can only be applied when mint is dormant. Pendimethalin only affects the weed seeds as they germinate. Pyridate, on the other hand, is applied at a different stage of growth of the weed compared to that of pendimethalin. The current Oregon request (99OR27), now under review in BEAD, is for the use of pyridate applied post-emergence to control kochia and redroot pigweed in mint. Pyridate is applied on actively growing mint when the weeds have already germinated and/or are past the seedling stage. Pyridate can be applied throughout the growing season to control multiple flushes of weeds.

We have contacted the listed experts for mint production in OR, MT, ID, WA, WI, and IN and have sent them a list of questions about their state's sect. 18 request for pyridate. All responses were in agreement that there is inadequate weed control in mint. Please see Appendices Nos. 1- 6 for more information on comments by the experts. Our summary of responses of experts in the 6 states follows: Redroot pigweed is a big problem in mint fields in all 6 states (more details to follow). Kochia is not yet a problem in MT, IN and WI; however, these 3 states may have infestations of as many as seven pigweed species (Amaranthus spp.). Several of these pigweed species have resistance to terbacil, which, according to Robert Parker, persists in WA soil for 2 years. Terbacil is the preferred chemical control which can be applied at preemergence and at post-emergence. Pigweeds can reduce mint yields and they can reduce mint oil quality to the point of rejection (loss) of a shipment of mint oil. In western states, e.g., WA and OR, growers use no-till to, e.g., avoid spreading Verticillium wilt which is a fungal disease that is very destructive to mint. In the Midwest, e.g., IN and WI, growers use tillage to some extent e.g., they use soil to cover and protect mint roots from cold winters. According to Robert Parker, the timing of applying oxyfluorfen, paraquat, and bromoxynil is wrong because they must be applied when mint is dormant and that is before the weeds, especially pigweed, begin growing.

We conclude, for the 6 states, that postemergence chemicals are not selective enough to avoid injury to actively growing mint. Lack of adequate control of pigweed species is a serious problem which is common to the 6 states. The use of pyridate is justified because the registered chemicals are not effective in controlling pigweeds, especially redroot pigweed which can reduce mint yield as well as lower the quality of mint oil. Weed impact on mint oil quality is difficult to quantify and hard to predict.

Economic Aspects

The states of OR, MT, ID, WA, WI, and IN requested the use of pyridate (Tough 5EC herbicide) to control weeds in mint specifically kochia (Kochia scoparia) and Redroot Pigweed (Armaranthus retroflexus). The maximum number of acres of mint expected to be treated is estimated to be 63,600 acres.

To determine if there is a significant economic loss with the current control alternatives, the net revenue method was used which incorporates economic data submitted by the various mint producing states. Net revenue is defined as mint grower gross revenue less total costs of production on a per acre basis. From this information, upper, lower, and average net revenue bounds were calculated to determine the normal range of revenue over a five year period. The minimum yield loss is used to determine what the expected revenues for mint growers might be in the current growing season. Minimum yield loss is defined as the economic loss that reduces net revenue of mint growers from the average value to the five year minimum value with price and cost held constant. Estimated yields with losses factored in are multiplied by the average price to determine the adjusted gross revenue. Then the average cost is subtracted from the yield loss adjusted gross revenue to estimate the growers net revenue with the current controls. If the adjusted net revenue generated by the expected yield loss is less than the lower bound estimate of "normal" net revenues than it is concluded that a significant economic loss will be realized. However, in many emergency requests, minimum yield loss is based only upon expert opinion of an estimated maximum possible yield loss compared to the requested control. Because mint is a minor crop and has greater variation in yield, price and net revenues than conventional crops, yield losses that produce significant economic losses have to be extreme before significant economic losses can be realized. In addition, mint growers are more susceptible to quality losses that impact net revenues that are much more difficult to quantify.

According to the state expert, Dr. Stougaard, (Personal Correspondence,3/99), mint yield losses for the current year are expected to be around 15% with nearly 100% of the growers affected. Using the Montana mint production economic data, a significant economic loss will occur when yield losses of 12% are realized. A yield loss of 12% produces a net revenue which is outside the normal range of net revenues. The loss is great enough to produce a significant economic loss. Yield losses in WA, ID, OR, WI, and IN are expected to range from 22%-47% depending upon geographic area, climate and pest pressure. The minimum yield loss that would produce a significant economic loss for these states ranges between less than 10% to15%. In conclusion, mint growers in the states of MT, WA, ID, OR, WI, and IN are all expected to experience.significant economic losses with the current available controls.

APPENDIX 1

Ms. Carol Mallory-Smith provided the following responses:

To: Saulmon.James
cc:
Subject: RE: sec 18 99OR0027

Dear Mr. Saulmon
We have filled in the numbers with our best estimates. The control would be the same for peppermint or spearmint for each herbicide. The reason we do not get control of these weed species with some of the herbicides like paraquat or oxyfluorfen is that they can not be used at the time of year that kochia and pigweed would be present.
Caro Mallory-Smith
-----Original Message-----
From: Saulmon.James@epamail.epa.gov
[SMTP:Saulmon.James@epamail.epa.gov]
Sent: Tuesday, March 30, 1999 12:56 PM
To: Carol.mallory-smith@orst.edu
Cc: Saulmon.james@epamail.epa.gov
Subject: sec 18 99OR0027
Dear Ms. Mallory-Smith,
(Please note that my email to Dr. Appleby was returned; it failed to reach him apparently.)
Thank you in advance for responding to the questions below. Due to conflicts with training schedule resulting in less time to review the sec 18(99OR0027) involved, I must ask for your response by close of business on Wednesday (3/31/99). Please respond via email to me; again, many thanks for your efforts.
James G. Saulmon, Ph.D. USEPA. Phone: 703-308-8126; fax: 703-308-8090.

RE: Sec 18 questions - pyridate use on mint in MT & OR to control kochia & redroot pigweed

1. What is the percentage of mint yield losses this year? a... [Mallory-Smith, Carol] 20 . What % of growers are affected? b [Mallory-Smith, Carol] 10 -----

2. What are the expected yield losses with existing controls compared to last 5 years yield? [Mallory-Smith, Carol] same

3. What has changed in weed control of kochia & redroot pigweed in mint in the last 5 years? [Mallory-Smith, Carol] pendimethalin has been erratic on these two weeds. Pendimethalin has a Section 18.

4. Have MT & OR mint growers ever had adequate control of kochia & redroot pigweed? [Mallory-Smith, Carol] yes, but terbacil resistance is now widespread

5. For MTs 3,600 acres of mint acres claimed for sec 18,
5a,b. what % is in spearmint? a.....; & what % of acres is in peppermint? b.....

5c,d. what % of the mint acres are infested with kochia? c.....% & redroot pigweed? d.....%.

6 . For ORs 18,000 acres of mint acres claimed for sec 18,
6a,b. what % is spearmint? a..... [Mallory-Smith, Carol] 5 .....%.; & what % of acres is peppermint? b..... [Mallory-Smith, Carol] 95 .....%.

6c,d. what % of the mint acres are infested with kochia? c [Mallory-Smith, Carol] 60 ....%) & redroot pigweed? d... [Mallory-Smith, Carol] 60 ....%).

7. What is your best estimate of percentage weed control? [%w.c.] (at the proper timing) of (1) kochia (2) red root pigweed using the following registered herbicides in:

PEPPERMINT Preemergence	(1) %w.c. of Kochia	(2) %w.c. of redroot pigweed
a. terbacil [not federally registered on mint, based on 3/30/99 NPIRS search]	50	0
b. paraquat	0	0
c. oxyfluorfen	60	0
Postemergence		
d. bromoxynil	20	0
e. bentazon [not federally registered on mint, based on 3/30/99 NPIRS search]	0	40
f. other clopyralid	0	0
pendimethalin	60	40
SPEARMINT		
Preemergence		
g. terbacil [not federally registered on mint, based on 3/30/99 NPIRS search]	50	0
h. paraquat	0	0
i. oxyfluorfen	60	0
j. other		
Postemergence		
k. bromoxynil		
l. bentazon [not federally registered on mint, based on 3/30/99 NPIRS search]		
m. other		

MANY THANKS.

APPENDIX 2

Dr. Robert N. Stougaard provided the following responses:

Saulmon.James
cc:
Subject:
Re: Sec 18 (99MT0012) - questions

At 03:16 PM 3/30/99 -0500, you wrote:
Dr. Stougaard,
thank you in advance for your responses. Please
respond by close of business on Wednesday, 3/31/99.
Jim Saulmon tel: 703-308-8126

Thank you in advance for any response to the questions below. Due to conflicts with training schedule resulting in less time to review the sec 18(99MT0012) involved, I must ask for your response by close of business on Wednesday >(3/31/99). Please respond via email to me again, many thanks for your efforts.
James G. Saulmon, Ph.D. USEPA. Phone: 703-308-8126; fax: 703-308-8090.

RE: Sec 18 questions - pyridate use on mint in MT & OR to control kochia & redroot pigweed

1. What is the percentage of mint yield losses this year? a.15%
What % of growers are affected? b 100%

2. What are the expected yield losses with existing controls compared to last 5 years yield? Pigweed results in about a 15% yield decrease on a per acre basis. Yield losses are greater owing to the fact that mint acreas (sic) have increased (2X) in the past 5 years.

3. What has changed in weed control of kochia & redroot pigweed in mint in the last 5 years? Nothing - no new chemicals have been labled (sic) for pigweed control.

4. Have MT & OR mint growers ever had adequate control of kochia & redroot pigweed? NO

5. For MT's 3,600 acres of mint acres claimed for sec 18, NOTE: MONTANA HAS 6500 ACRES
5a,b. what % is in spearmint? a.1/3;

& what % of acres is in peppermint? b.2/3

5c,d. what % of the mint acres are infested with kochia? c.0% & redroot pigweed? d.100%.

6 . For ORs 18,000 acres of mint acres claimed for sec 18,
6a,b. what % is spearmint? a.....%.; & what % of acres is peppermint? b.....%.
6c,d. what % of the mint acres are infested with kochia? c.....%) & redroot pigweed? d.....%).

7. What is your best estimate of percentage weed control? [%w.c.] (at the proper timing) of (1) kochia (2) red root pigweed using the following registered herbicides in:

PEPPERMINT	(1) %w.c. of Kochia	(2) %w.c. of redroot pigweed
Preemergence		
a. terbacil		0
[not federally registered on mint, based on 3/30/99 NPIRS search]		
b. paraquat		0
c. oxyfluorfen		10
Postemergence		
d. bromoxynil		0
e. bentazon		0
[not federally registered on mint, based on 3/30/99 NPIRS search]		
f. other		
SPEARMINT		
Preemergence		
g. terbacil		0
not federally registered on mint, based on 3/30/99 NPIRS search]		
h. paraquat		0
i. oxyfluorfen		10
j. other		
Postemergence		
k. bromoxynil		0
l. bentazon		0
[not federally registered on mint, based on 3/30/99 NPIRS search]		
m. other		

MANY THANKS.

Robert N. Stougaard
Associate Professor, Weed Science
Northwestern Agricultural Research Center
Montana State University
4570 Montana 35
Kalispell, MT 59901

Phone: 406-755-4303
FAX: 406-755-8951
E-mail: ms@montana.edu

APPENDIX 3

James Saulmon/DC/USEPA/US@EPA
cc:
Subject: RE: sec 18 - pyridate use on mint Idaho.

Jim: my response to your questions are as follows:

Question (1a): 3 to 5 % loss
(1b): 95%

Question (2): Higher. Cost of herbicides and low oil prices as kept growers from applying preemergence herbicides that are effective for the control of redroot pigweed and kochia.

Question (3): I feel the problem has continued to expand during the past 5 years because grower reluctance to apply expensive dormant herbicide treatments in the winter when they can't see the problem. When the weeds emerge, there are no treatments available that effectively control the weed species and provide adequate crop safety.

Question (4): Yes. If terbacil and oxyfluorfen are applied as a dormant winter treatment. However, these treatments may cause some short-term phytotoxicity to the crop early in the growing season -- usually, there is no measurable oil yield reduction. Late applications do cause sufficient crop damage to reduce oil yield.

Question (5a): 7%
(5b): 93%
(5c): 95%
(5d): 95%

Question (6): My research results over the past three years show the following:

PREEMERGENCE	KOCHIA	REDROOT PIGWEED	CROP INJURY
terbacil	90%	90%	5-7%
paraquat	0%	0%	0%
oxyfluorfen	90%	90%	5-7%
other	-	-	-
POSTEMERGENCE			

terbacil	50%	50%	10-15%
bromoxynil	90%	90%	10-15%
bentazon	30%	30%	5-10%
other	-	-	-

thank you

Gary A. Lee
Professor of Weed Science

-----Original Message-----
From: Saulmon.James@epamail.epa.gov
[mailto:Saulmon.James@epamail.epa.gov]
Sent: Friday, April 16, 1999 11:16 AM
To: glee@uidaho.edu
Cc: saulmon.james@epamail.epa.gov
Subject: sec 18 - pyridate use on mint Idaho.
Dr. Lee,
Please see the enclosed questions. Thanks.
Jim Saulmon

To:

RE: Sec 18 questions - pyridate use on mint to control kochia & redroot pigweed

From: James G. Saulmon, Ph.D. USEPA. Phone: 703-308-8126; fax: 703-308-8090.

THANK YOU in advance for any response to the questions below. Please respond via e-mail by Monday COB (April 18, 1999) to: saulmon.james@epa.gov

1a. What is your state?s percentage of mint yield losses this year?
1b. What % of growers are affected?

2. What are the expected yield losses with existing controls compared to the last 5 years yield?

3. What has changed in weed control of kochia & redroot pigweed in mint in the last 5 years?

4. Have mint growers ever had adequate control of kochia & redroot pigweed?

5. For your state?s mint acreage claimed for sec 18,
5a. what % of acreage is in spearmint?

5b. what % of acreage is in peppermint?
5c. What % of mint acres are infested with kochia?
5d. What % of mint acres are infested with redroot pigweed?

6. What is your best estimate of percentage weed control? [%w.c.] (at the proper timing) of (1) kochia & (2) red root pigweed using the following registered herbicides in mint: (1) %w.c. of Kochia (2) %w.c. of redroot pigweed

Preemergence
a. terbacil
b. paraquat
c. oxyfluorfen
d. other
Postemergence
e. terbacil
f. bromoxynil
g. bentazon
h. other

file: C:\My Files\pyridate-sec 18 ques. for mint.

APPENDIX 4

James Saulmon/DC/USEPA/US@EPA
cc:
Subject: Re: sec. 18 questions - pyridate use on mint in Washington

At 12:57 PM 4/16/99 -0400, you wrote:
Dr. Parker,
Please see the enclosed questions. Thanks.
Jim Saulmon

RE: Sec 18 questions - pyridate use on mint to control kochia & redroot pigweed

From: James G. Saulmon, Ph.D. USEPA. Phone: 703-308-8126; fax: 703-308-8090.
THANK YOU in advance for any response to the questions below.
Please respond via e-mail by Monday COB (April 18, 1999) to:
GOTOBUTTON BM_1_ saulmon.james@epa.gov

1a. What is your state?s percentage of mint yield losses this year?
Mint hasn't been harvested yet this year.

1b. What % of growers are affected?

100% of the growers are affected by weeds

2. What are the expected yield losses with existing controls compared to the last 5 years yield?
I don't understand this question

3. What has changed in weed control of kochia & redroot pigweed in mint in the last 5 years?
Kochia was not found in very many fields 5 years ago. It is increasing in severity and found in a lot more fields.

4. Have mint growers ever had adequate control of kochia & redroot pigweed?
Not real good kochia control.

5. For your state?s mint acreage claimed for sec 18,
5a. what % of acreage is in spearmint?
I can't find my ag statistics, but it used to be approximately 33%
5b. what % of acreage is in peppermint?
approximately 67%
5c. What % of mint acres are infested with kochia?
20%
5d. What % of mint acres are infested with redroot pigweed?
100% is infested with one of the pigweeds either redroot pigweed or Powell amaranth, most people can't tell the difference. I can't tell the difference until the plant flowers

6. What is your best estimate of percentage weed control? [%w.c.] (at the proper timing) of (1) kochia & (2) red root pigweed using the following registered herbicides in mint:

	(1) %w.c. of Kochia	(2) %w.c. of redroot pigweed
Preemergence		
a. terbacil	20	40
b. paraquat	0	0
c. oxyfluorfen	10	0
d. other		
Postemergence		
e. terbacil	10	75
f. bromoxynil	10	60
g. bentazon	10	40
h. other		
clopyralid	0	0

I have not seen the proposed Section 18. One of the problems with existing herbicides is that the timing is wrong for controlling these weeds.

Oxyfluorfen, paraquat and bromoxynil are good, but they must be applied while the mint is dormant and that is before the weeds begin growing, particularly the pigweeds. Terbacil persists in the soil for 2 years, and growers are hesitant to use it in some situations, because if the mint winter kills or is to be plowed out, the chemical residues will prevent cropping for 2 years after the last application. The growers need an effective herbicide that can be used during the growing season.

file: C:\My Files\pyridate-sec 18 ques. for mint.

Bob Parker
Extension Weed Scientist
Washington State University
24106 N. Bunn Road
Prosser, WA 99350
Voice: (509) 786-9234
FAX: (509) 786-9370

APPENDIX 5

James Saulmon/DC/USEPA/US@EPA
cc:
Subject: Re: sec 18 -pyridate use on mint in Wisconsin

At 01:44 PM 4/16/99 -0400, you wrote:

Dr. Binning,
Please see the attached questions. Thanks.
Jim Saulmon
RE: Sec 18 questions - pyridate use on mint to control kochia & redroot pigweed

From: James G. Saulmon, Ph.D. USEPA. Phone: 703-308-8126; fax: 703-308-8090.
THANK YOU in advance for any response to the questions below.
Please respond via e-mail by Monday COB (April 18, 1999) to:
GOTOBUTTON BM_1_ saulmon.james@epa.gov

1a. What is your state?s percentage of mint yield losses this year?15-20%
1b. What % of growers are affected? 40%

2. What are the expected yield losses with existing controls compared to

the
last 5 years yield? Since we have a resistance problem there is an increase each year. I would expect an additional 5 to 10 %

3. What has changed in weed control of kochia & redroot pigweed in mint in the last 5 years? Kochia is not a wisconsin Problem.. The pigweed is resistant to our existing herbicide programs.

4. Have mint growers ever had adequate control of kochia & redroot pigweed?
We have had adequate control of pigweed before resistance became a problem.

5. For your state?s mint acreage claimed for sec 18,
5a. what % of acreage is in spearmint? 40%
5b. what % of acreage is in peppermint? 60%
5c. What % of mint acres are infested with kochia? Not a serious wisconsin problem
5d. What % of mint acres are infested with redroot pigweed? 100% pigweed with a high % showing some resistance.

6. What is your best estimate of percentage weed control? [%w.c.] (at the proper timing) of (1) kochia & (2) red root pigweed using the following registered herbicides in mint: (1) %w.c. of Pigweed
redroot pigweed
Preemergence
a. terbacil 0-95% depending on weather and amount of resistance
b. paraquat not used
c. oxyfluorfen rarely used do to emergence of the mint before the application can be made.
d. other
Postemergence
e. terbacil 0-95 % depending on the above mentioned factors.
f. bromoxynil 20%
g. bentazon 0-80% depends again on the weather and timing
h. other Currently nothing else is used. Cultivation can be effective but we resist using cultivation
since it spreads wilt. Herbicides become an excellent IPM tool to avoid a wilt problem where we can keep the
cultivators out of the field.

If you have other questions I will try and back to you as soon as possible.
Larry

file: C:\My Files\pyridate-sec 18 ques. for mint.

APPENDIX 6

weller@hort.purdue.edu
cc: James Saulmon/DC/USEPA/US@EPA
Subject: questions about sec. 18 for pyridate use on mint in Indiana

Dr. Weller,
Please see the enclosed questions (1 page). Thanks.
Jim Saulmon

(See attached file: pyridate - sec 18 ques. for mint) To:

RE: Sec 18 questions - pyridate use on mint to control kochia & redroot pigweed

From: James G. Saulmon, Ph.D. USEPA. Phone: 703-308-8126; fax: 703-308-8090.

THANK YOU in advance for any response to the questions below.
Please respond via e-mail by Monday COB (April 18, 1999) to:
GOTOBUTTON BM_1_ saulmon.james@epa.gov

Pigweed types which include redroot, smooth, powell amaranth, tumble, prostrate and water hemp are the major weed in Indiana mint which can not be adequately controlled. At present we have no kochia infesting Indiana mint fields.

1a. What is your state?s percentage of mint yield losses this year? Due to pigweed types the range is from 5 to 45% based on my observations and grower interviews. This range is due to the age of the planting and the type of agronomic rotation program the grower has followed. The percent loss will tend to increase as the age of the mint planting increases (pigweeds are worse and more difficult to control in the second, third and fourth year of a rotation.

1b. What % of growers are affected? I would estimate that 100% of our gr owers have pigweeds in their mint fields. This is based on 1996 and 1997 grower surveys.

2. What are the expected yield losses with existing controls compared to the last 5 years yield? The losses are higher in the last 5 years. This is due to a shifting of the pigweed populatins from predominately redroot and smooth to a combination of predominately waterhemp amd powell. These shifts are a result of more use of herbicides like Pursuit, Scepter and Classic in the soybean rotation and these herbicides are very good against redroot and smooth but do not control the water hemps or powell as well and their population numbers increase going into the mint rotation. All registered mint herbicides tend to be inherently weak against pigweed types so higher initial populations mean worse pigweed control in the mint crop.

3. What has changed in weed control of kochia & redroot pigweed in mint in the last 5 years? See above for the reasons. Greater variety of pigweed types, no new effective herbicides, the difficulty in using any cultural control except high crop populations since cultivation ids impossible after the first year of a mint crop.

4. Have mint growers ever had adequate control of kochia & redroot pigweed? No. The control is always marginal. In situations with a solid mint stand (which normally does not occur) and use of a preemergent sinbar tratment and repeated postemergence application (usually about 2 -3 applications) of sinbar and basagran plus oil, the grower can sometimes reduce the infestations to a managable level.

5. For your state?s mint acreage claimed for sec 18,
5a. what % of acreage is in spearmint? 20%
5b. what % of acreage is in peppermint? 80%
5c. What % of mint acres are infested with kochia? 0
5d. What % of mint acres are infested with redroot pigweed? 100% in some % or another which will vary as stated above.
6. What is your best estimate of percentage weed control? [%w.c.] (at the proper timing) of (1) kochia & (2) red root pigweed using the following registered herbicides in mint:

	(1) %w.c. of Kochia	(2) %w.c. of redroot pigweed
Preemergence		
a. terbacil	N/A	75% up to 85%
b. paraquat	N/A	only spot treatment, not generally used
c. oxyfluorfen	N/A	70 to 90% not used much because of crop phytotoxicity
d. other		
Postemergence		
e. terbacil	N/A	85 % if applied to weeds leass than 3-4 inches tall
f. bromoxynil	N/A	80% " " except weeds have to be 2-4 inches tall or less , etc, growers don't tend to use because of application timining restrictions and crop injury
g. bentazon	N/A	less than 65%
h. other		many growers use a combination of terbacil and bentazon and this can get about 85% of the pigweed as long as it is small, but in most cases with all these post treatments many of the weeds are not killed and resume growing and cause yield loss. Pyridate is really needed to assist growers in their pigweed control

Steve weller
file: C:\My Files\pyridate-sec 18 ques. for mint.
F:\USER\share\SECT_18\DRAFTS\99-MT-12.wpd